

What is claimed is:

1. A method for calibrating a driver in an dual actuator disk drive, comprising:
determining a measured capacitance associated with at least one piezoelectric element
prior to positioning the piezoelectric element over a disk surface; and
adjusting said driver based on said determining step.

2. A method, as claimed in claim 1, further comprising:
secondly determining a second measured capacitance associated with said at least one
piezoelectric element after a predetermined time period following said adjusting step; and
secondly adjusting said driver based on said determining step.

3. A method, as claimed in claim 1, wherein said determining step comprises:
driving said at least one piezoelectric element to a predetermined starting voltage;
supplying a predetermined current to said at least one piezoelectric element for a
predetermined time period;

5 measuring a second voltage associated with said at least one piezoelectric element
after said supplying step; and
calculating said measured capacitance based on said measuring step.

4. A method, as claimed in claim 3, wherein said calculating step is performed
based on the following equation:

$$C = I * (T/(V_{m2} - V_{m1}))$$

where C is the measured capacitance, I is the current supplied to said at least one piezoelectric element during said supplying step, T is the predetermined time period; V_{m2} is the second voltage, and V_{m1} is the starting voltage.

5. A method, as claimed in claim 1, wherein said determining step comprises:
driving said at least one piezoelectric element is a predetermined starting voltage;
supplying a predetermined current to said actuator element;
starting a timer;
5 monitoring a voltage associated with said at least one piezoelectric element;
stopping said timer to get an elapsed time when said voltage reaches a predetermined voltage level in said monitoring step; and
calculating said measured capacitance based on said elapsed time.

6. A method, as claimed in claim 5, wherein said calculating step is performed based on the following equation:

$$C = I * (T / (V_{m2} - V_{m1}))$$

where C is the measured capacitance, I is the current supplied to said at least one piezoelectric element during said supplying step, T is the elapsed time, V_{m2} is the predetermined voltage level, and V_{m1} is the starting voltage.

7. A method, as claimed in claim 1, wherein said adjusting step includes:
determining a difference between said measured capacitance and an expected capacitance; and
adjusting a gain associated with said driver based on said determining step.
8. A method, as claimed in claim 1, wherein said driver is a voltage control driver.
9. A method, as claimed in claim 1, wherein said driver is a charge control driver.

10. A hard disk drive comprising:

at least one disk rotatable about an axis;

an actuator assembly moveable relative to said disk;

a transducer positioned on said actuator assembly;

5 a piezoelectric element disposed on said actuator assembly and operable to move at least the transducer relative to a surface of the disk;

a calibration circuit operable for determining a capacitance associated with the piezoelectric element; and

10 a piezoelectric power supply operable for supplying power to said piezoelectric element based on said capacitance associated with the piezoelectric element.

11. A hard disk drive, as claimed in claim 10, wherein said piezoelectric element comprises at least two piezoelectric crystals.

12. A hard disk drive, as claimed in claim 11 wherein said piezoelectric crystals are disposed on said actuator assembly with opposed polarizations such that said crystals work in unison to reposition said transducer.

13. A hard disk drive, as claimed in claim 10, wherein said calibration circuit is operable to deliver a constant current to said piezoelectric element.

14. A hard disk drive, as claimed in claim 10, further comprising:

a mode switch operable to connect said piezoelectric element to one of said piezoelectric power supply or said calibration circuit.

15. A hard disk drive, as claimed in claim 10, wherein said piezoelectric power supply includes:

a charge control driver operable to deliver charge to said piezoelectric device and to remove charge from said piezoelectric device; and

5 a dynamic range adjustment portion operable to adjust a dynamic range of said charge control driver.

16. A hard disk drive, as claimed in claim 15, wherein said dynamic range adjustment portion is operable to adjust said dynamic range based on said capacitance associated with the piezoelectric element.

17. A hard disk drive, as claimed in claim 10, further comprising:

a voltage control driver operable to control a voltage across said piezoelectric element; and

5 a gain adjustment portion operable to adjust a voltage gain associated with said voltage control driver.

18. A hard disk drive, as claimed in claim 17, wherein said gain adjustment portion is operable to adjust said voltage gain based on said capacitance associated with the piezoelectric element.

19. A method for determining a number of piezoelectric elements present in a dual actuator hard disk drive, comprising:

determining a total capacitance associated with at least one piezoelectric element;

5 ascertaining a number of piezoelectric elements present in said disk drive based on said determining step.

20. A method, as claimed in claim 19, wherein said determining step comprises:

driving said at least one piezoelectric element is a predetermined starting voltage;

supplying a predetermined current to said at least one piezoelectric element for a predetermined time period;

5 measuring a second voltage associated with said at least one piezoelectric element after said supplying step; and

calculating said total capacitance based on said measuring step.

21. A method, as claimed in claim 20, wherein said calculating step is performed based on the following equation:

$$C = I * (T/(V_{m2} - V_{m1}))$$

where C is the total capacitance, I is the current supplied to said at least one piezoelectric
5 element during said supplying step, T is the predetermined time period; V_{m2} is the second voltage, and V_{m1} is the starting voltage.

22. A method, as claimed in claim 21, wherein said ascertaining step comprises:
dividing said total capacitance by an expected capacitance and rounding to the closest
natural number.

23. A method, as claimed in claim 19, wherein said expected capacitance is
approximately a capacitance associated with a single piezoelectric element.